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(Article begins on next page)

# AGRICULTURAL GENDER INDICATORS TO IMPROVE DEVELOPMENT PROGRAMS: A CRITICAL APPROACH

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## Abstract

*The use of indicators as tools to summarise large amounts of data, providing information as comprehensive as possible about a particular phenomenon, it is largely shared by the academic world. Nevertheless, it may be noted how the supply and the availability of gender indicators, applied to the specific framework of natural resources and agriculture, are very limited, especially in developing countries. This research would therefore analyse this lack, focusing on the importance of identifying gender indicators in rural settings of these Regions, comparable over time and space. Gender indicators in agricultural developing contexts can have multiple purposes: they can be a methodological resource for the comparative analysis of gender in the stages of feasibility, monitoring and evaluation of cooperation projects, focused in rural-agricultural issues, as well as having an impact on national agricultural policies, lobbying and advocacy. For this reason, in a general turmoil context like the present, characterised by the debate on the new Sustainable Development Goals, included in the Post 2015 Development Agenda, gender indicators in agricultural contexts may play an important role as support instrument for the new global instances. Moreover at micro level, the development and the provision of gender indicators, as much as possible qualitative and all-encompassing, would appropriately supplement the deficiencies in statistical terms frequently observed by technicians and researchers, both at national databases level, both within national or regional specific field surveys, particularly in the Southern countries. In conclusion, the need to measure the actual incidence of women in natural and agricultural resource management, could be translated in the development of indicators gender-sensitive oriented, to be used as a tool to analyse, and possibly promote the active participation of women in political and economic life in the North as in the South of the world.*

## The research background

Indicators are commonly defined as tools able to summarize large amounts of data with the purpose of representing a dynamic situation (i.e. time trends of the level of education, of the average number of children, etc.) and, therefore, with the unique task to “state” [1]. As a consequence the problem of qualitative and quantitative indicators, such as gender and social indicators [2] immediately arises, in which numerical information is almost never sufficient and it needs to be complemented with qualitative analyses (often more complex than quantitative, especially if one-dimensional, i.e. based on only one type of data).

In order to make information comparable with each other, it must be added the difficulty to standardize them, because who is working with these data is obliged to scaling operations. The situation becomes even more complicated when gender indicators in rural areas are considered, where there is a less accessible location for the information, such as the Sahelian villages are. If on one hand is complex having national data disaggregated by sex, on the other hand is even more difficult to obtain local data, often completely excluded by the national statistical supply.

Another critical aspect is related to the definition of indicators to measure the level of gender “empowerment/ un-empowerment”. Naila Kabeer [3] gives a definition of empowerment as a possibility to make strategic life choices in a context in which these choices were first denied. The empowerment of women thus involves both the importance of increasing their strength decision-making, both the right to determine free choices in their life and to influence the direction of change, through the ability to increase their control over resources and materials [4].

The UNDP (United Nations Development Programme) has tried to quantify this dynamic change from a gender point of view, introducing in the Human Development Reports [5] the GEM (Gender Empowerment Measure), aimed to highlight the level of participation of women in political, professional and economic sectors. This indicator was however, soon questioned by several authors [6] for different reasons. For example, the GEM does not measure gender inequalities since it only concerns women with higher levels of education and economically advantaged and political situation at national level as well; in fact it does not take into account the contexts economically less visible and comprehensive by statistics such as the rural areas. For these reasons subsequent amendments were proposed [7].

The gender empowerment is not just a set of quantifiable information, but it is also a mixture of motivations and objectives that accompanies the actions of men and women towards change and new opportunities (“the agency”) and is certainly not efficiently represented by only one indicator [8].

Moreover, according to other authors, no indicator, although articulated, is able to capture the subtle implications of

power relations which are established among different stakeholders in the processes of change and empowerment. Accordingly this “numerical” approach has to be combined to targeted qualitative analyses [9].

The measure of change and the decision of which aspects to measure and how to measure them as well, is thus something complex and cannot be attributable to a mere technical exercise, especially if the progress is measured in terms of gender equality, which also entails a strong political component [10].

With respect of the overall problem complexity, this study intends to suggest gender indicators to implement a development project aimed to improve the subsistence level and the quality of life of the population across a rural area of sub-Saharan Africa. Another goal of the paper is to reflect on the effectiveness of these indicators as well as on their contribution (or not) to a more equitable implementation of such development projects.

With this regards we individuated a sample case represented by the Senegalese Statistics Information System. In particular our analysis was focused on the national statistics supply and the general tendency related to the gender dimension at regional and national level, as well as applied to the specific sector of agriculture.

This research has been developed in the framework of a field survey carried out by the authors in Italy and in Senegal in 2013. The latter was an enquiry conducted under the umbrella of an international project held in Senegal and aimed to improve food security and agricultural production in some specific regions of the country. This project is expected to involve a target of about 3000 women. In particular, the project aims to provide small irrigated plots of land, designed for activities of horticulture and fruit production (in which traditionally women play a key role) and that will be managed in according to communitarian principles.

Accordingly, since the mentioned project presents a strong technological component, the need to analyse in a critical way some specific issues as fair access and management of technology as well as technical trainings to women involved in the project, appears fundamental.

Considering the access to technology, many studies conducted in Senegal [11], have shown evident differences between men and women, in terms of access to resources and management of technological applications, especially in the agricultural field. But these disparities do not forcibly entail negative effects for women. Indeed it seems that in some cases, provided that they can count on a fair and available access to technology, women have proved more entrepreneurial and innovative than men.

### ***The research methodology and the indicators elaboration***

The methodological choices of the field survey were organised as following.

After having individuated the main subjects to assess in relation with gender and agricultural sector, we set-up a statistical matrix aimed to collect data and divided into five different sections.

- demographic indicators
- social indicators
- economic indicators (with a special focus on rural context)
- occupation in the agricultural sector and grass-roots organisations
- agricultural production for exportation

On the basis of the available data three indicators for each region interested by the project have been elaborated: a Nutritional Index, an adjusted Gender Inequality Index and an Index of Economically Qualified Presence of Women and Men in Agriculture.

In this context we occur to specify how the analysis carried out at regional level, although if more specific than that of the whole, will never be able to identify what is really happening in rural communities, in villages and individual *ménage*, which can be investigated only through direct interviews.

The context of analysis consists in three bordering regions, two of which geographically and economically more advantaged (with access to sea and commercial activities), while the third is more inland, drought-prone and not provided with an efficient road network.

Regarding the specific characteristics of the sample, Region 1 consists in 50 rural communities and municipalities, compared with 36 in the Region 2 and 39 of the Region 3. In particular, Region 2, larger than the others, is the region with the greatest rural extent, while in Region 3 a more pronounced population residing in urban areas exists. In contrast, a more uniform distribution of the population between rural and urban areas is observed in Region 1 (Table 1).

**Table 1. Distribution of the population in the three analysed regions**

	NATIONAL		Region_1		Region_2		Region_3	
	Women	Men	Women	Men	Women	Men	Women	Men
Total population	6.348.578	6.506.575	849.116	849.296	382.901	387.292	668.173	731.046
Urban	6.101.448		872.814		104.669		891.442	
<b>Rural</b>	<b>6.753.705</b>		<b>825.598</b>		<b>665.524</b>		<b>507.777</b>	
Area (km <sup>2</sup> )	196.722		6.597		7.049		4.862	
Ratio urban/total	0,47		0,51		0,14		0,64	
Ratio rural/total	0,53		0,49		0,86		0,36	
Total population / km <sup>2</sup>	65,35		257,45		109,26		287,79	
<b>Rural population / km<sup>2</sup></b>	<b>34,33</b>		<b>125,15</b>		<b>94,41</b>		<b>104,44</b>	

On the gender dimension, although women in the three regions are numerically slightly higher than men, it is not possible to know whether they are more prevalent in rural areas (as it might be supposed).

In the Table 1 we can see significant findings of the lack of specific gender oriented statistics in rural areas, while an interesting question emerges from Table 2, in which is evident that in Region 3 the percentage of emigrants men is significantly higher than in the other two Regions.

**Table 2. Number and percentage of emigrants (per sex and per region)**

	NATIONAL		Region_1		Region_2		Region_3	
	Men	Women	Men	Women	Men	Women	Men	Women
Total population	6.348.578	6.506.575	849.116	849.296	382.901	387.292	668.173	731.046
Emigrants	144.527	32.164	10.479	2.255	4.107	1.502	16.506	929
%	<b>2,3</b>	<b>0,5</b>	<b>1,2</b>	<b>0,3</b>	<b>1,1</b>	<b>0,4</b>	<b>2,5</b>	<b>0,1</b>

Instead, in respect to the elaboration of the three indicators and the sources of data as well, firstly we identified a discriminating indicator on the under nutrition of the population using the percentage of malnourished children (under 5 years) and their mortality rate, together with the BMI (Body Mass Index) of the adult population.

The body mass index (expressed in kg/m<sup>2</sup>), is a factor that helps to identify segments of the population underweight: if  $18.4 < \text{BMI} < 17$  we are in presence of a chronic energetic deficiency, while if  $\text{BMI} < 17$  the thinness is considered severe. The nutritional indicator is a percentage (ranging between two extremes never reached in practice, 0 and 100 and very similar to the Global Hunger Index, GHI) which indicates that the population in some way may suffer from nutritional and environmental problems (information provided by data on children, Table 3).

**Table 3. Undernourished population, with BMI<18,4**

	NATIONAL		Region_1		Region_2		Region_3		Source
	Men	Women	Men	Women	Men	Women	Men	Women	
% undernourished children (age<5)	0,19	0,17	0,15		0,11		0,19		EDS V
children mortality rate (age<5)	0,0091	0,0083	0,0053		0,0088		0,0104		EDS V
BMI<18.4 (significant thinness)	0,282	0,220	0,242	0,208	0,253	0,161	0,409	0,295	EDS MICS
<b>Nutritional indicator</b>	<b>15,9</b>	<b>13,2</b>	<b>13,4</b>	<b>6,9</b>	<b>12,5</b>	<b>5,4</b>	<b>20,3</b>	<b>9,8</b>	calculated

In Table 3 the indicator of under-nutrition is always higher for men than for women, both at National and Regional level, with a dramatic 20.3 registered in Region 3, while Region 2 seems to be less in emergency.

The second indicator that was calculated, the GII (Gender Inequality Index), entailed some problems. The GII is a measure that captures the loss in achievements due to gender disparities in the dimensions of reproductive health, empowerment and labour force participation. Values range from 0 (perfect equality) to 1 (total inequality). GII is a composite indicator, which involves two indicators to measure women's reproductive health (the maternal mortality ratio and the adolescent fertility rate), two indicators to evaluate women's empowerment (educational attainment, secondary and above, and parliamentary representation) and the labour force participation indicator.

With regard to data of regional maternal mortality, they were taken from the National Demographic and Sanitary Survey of 2012 [12] as well as for the rates of teenager fertility. The information on the level of education of women and men were obtained during the mission carried out in Senegal on March 2013, as well as the number of economically active women and men.

Obtain data on the presence of women and men in local institutional charges (regional, provincial and municipal) has been much more complex: in fact, this specific data provided during the field mission, were related to the historical 2002-2007 and not divided by region. Nonetheless, through information available by the Gender Laboratory of the University of Dakar and thanks to other researches [13] it was possible to estimate fairly accurately the political presence of women and men within the three Regions.

Therefore all these data were used to calculate the adapted Gender Inequality Index (aGII). The aGII at National level (0.56) is equal to the GII reported in the Human Development Report of 2013 [14], while the adapted index of gender inequality is slightly higher in Region 1 (0.577) and even more in Regions 2 (0.611) and 3 (0.624).

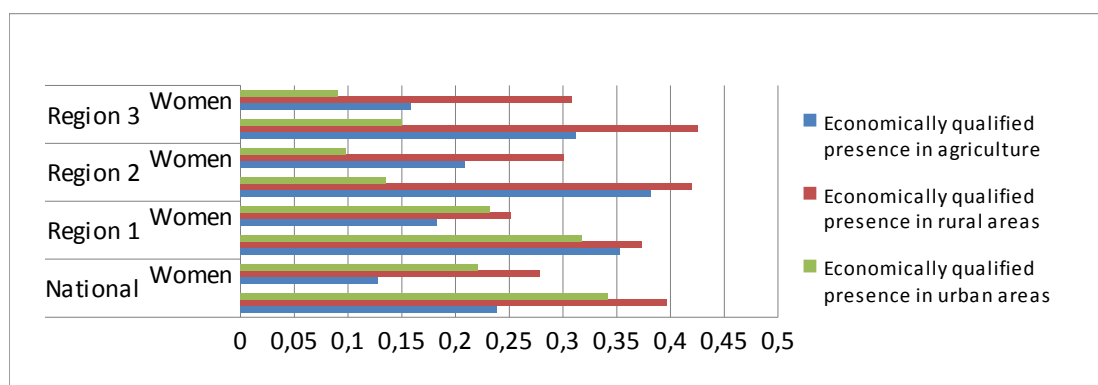
However what neither the indicator on food security conditions, nor the aGII show, is what happens in the countryside to compare with the urban space. Regional data are important and more detailed than the national: but what about, for example, on the level of schooling at least to the second level (as required by the GII) in cities than in the countryside? In addition to the (not secondary) aspects relating to the economic resources of families living in rural areas, are there roads and school facilities reached by boys and girls in the countryside? And again, the presence of accessible health centres considerable influence the maternal and child health level, but are they really accessible to the villages of rural communities? These considerations, of course, are valid also to all other sub-indices, indicating that a gap, if already exists at the level of the different regions of Senegal, is amplified inside the single Region and, even more, in the rural districts.

Moreover, from the information provided during the field mission of March 2013 (and divided by sex) we attempted to establish an index of the significant presence of women and men in agriculture, to be compared with that corresponding in rural and in urban areas as well. In synthesis, the following sub-indices (all divided by gender) have been used, in order to calculate the presence of economically qualified women and men in agriculture:

1. Adults literacy rate
2. Percentage of economically active population in agriculture
3. Percentage of people responsible for resources in agriculture (obtained from the sub-index of the economically active population)
4. Percentage of economically active population in rural areas (not necessarily corresponding to the agricultural sector, since includes services, trade and other activities performed in rural areas but not strictly related to agriculture)
5. Percentage of economically active population in urban areas

Finally the indices shown in the graph of Figure 1 have then been obtained: some numbers between 0 and 1 (as deducted by percentage).

**Figure 1. Economically Gender Qualified Index in Senegal and in the three analysed Regions**



We can note how in all sample regions, the index of the economically qualified presence in agriculture penalizes women, as well as in rural areas. In the cities the indexes of economically qualified presence are more similar for men and women, as well as even still much lower.

### ***The statistical supply on gender issues in the agricultural sector: an overview***

With regards to the outputs of the field research, first on the basis of the preliminary results, we can note how in Senegal accurate data disaggregated by gender in agricultural contexts or do not exist, or are not available, or are available primarily through direct qualitative surveys (which is difficult to access, especially if conducted by other institutions or international organisations).

However the consideration of the need of having gender-specific data, related in particular to the agricultural sector, is not new to researchers who have already worked on it in Senegal. This aspect has been already pointed out within the planning document for the National Strategy for Gender Equality and Equity ("SNEEG 2015"), in which is deplored the lack of gender disaggregated data, in particular relating to the sub-sectors of agriculture [15] (as those related to processing, marketing, horticulture and so on, or rather the activities in which rural women traditionally hold an important role).

In regard to this element, among the factors attributable to such deficit data, the role played by the lack of political will and support on the development of national policies is evident. Furthermore in this context, a lack of involvement in the negotiations of that civil society more active and interested in these subjects is often observed. Therefore, to deal with this limit, the need to create and promote favourable conditions to the collection of gender-specific data in the agricultural context (and not only), released at national and decision-making level and with regard to the real weight of women in agriculture, is increasingly necessary.

Nevertheless, it must be stressed that, even if on the one hand, within some specific national policies (as the same new National Strategy on Economic and Social Development) [16], the will and the need to address the lack of statistical data seem to be largely widespread; on the other hand, analysing more closely the types of indicators selected, gender issues still appear marginal.

In addition, in order to obtain a complete picture of the situation of gender in agriculture (as well as to supplement the lack of official data) the elaboration of gender sensitive indicators is not exhaustive. For this reason, as sustained by several authors [17], the use of qualitative research in the field, to be conducted at a representative sample of the target audience by the means of participatory methods, should also be addressed. However, in this context another set of problems arises: that often related to the failure to recognize and officially validate data collected through sample surveys on the ground, which consequently can not be fully exploited and used at central level. Accordingly, a method of harmonisation of data in order to compare them at regional and national level should also be identified.

With regards to this, it is even necessary to implement a deep sharing of the research outputs (present and future) with all the stakeholders implicated by the development projects, whether direct and indirect beneficiaries, active subjects of the preliminary field investigations as well as the internal staff of public bodies.

Other aspects that have been repeatedly cited are the will and the need to set up a joint database, accessible and available to all relevant stakeholder active in the field of the gender issues in agriculture. However many obstacles still exist, such as the extreme fragmentation of initiatives relating to this issue, the lack of coordination between them, the weak relations between technical staff and local authorities as well as the financial problems (especially at regional level). To deal with these weaknesses a proper management of such a hypothetical database shall be ensured. At the same time a better coordination of the information sharing as well as of the networking among the different levels involved has to be pursued.

In order to provide an overview as complete as possible of the statistician resources available at national and regional and related to the issue of gender in agriculture in Senegal, the second part of our study is consisted in a detailed analysis of all the available documentation (the most updated) concerning the gender aspects within the country.

One of the first element issued by the preliminary analysis is how the overall documentation sources can be considered particularly "virtuous" in the world of Senegalese statistics, since they generally offer the double advantage of having gender-disaggregated data and/or by region.

At this point a question arises: how to examine the level of detail of gender issues (related to both the agricultural sector and the regional dimension), developed within some of the major works and in relation to the specific statistical requirements of the study (a point that will be significantly explained in the second part of the analysis).

Nonetheless in the matter of the statistical sources specifically dedicated to the agricultural sector, within the national reports there is no reference nor to the gender nor to the division by age of farmers. This could be explained with the

apparently attention focused only on the strictly gross production of the Senegalese horticultural sector, ignoring the more qualitative dimensions, which instead would contribute to obtain a more complete picture of who actually works in the overall sector.

Actually, the evidence that all the statistical efforts are focused solely on produced quantities (i.e. t/ha, income/ha, main agricultural production,...) and exploited areas, is easily traceable to such data for production and export crops are the most popular. This latter could be explained in the light of the economic weight and the consequent strong influence in the decision-making processes, represented by the horticultural export sector in a country as Senegal [17bis]. In regard to this, it is not surprising to observe how these types of data (that symbolise directly the interests of agribusiness, mostly foreign), are more easily traceable and mastered by the two major professional organisations of the country: the ONAPES - “Organisation Nationale Des Producteurs Et Exportateurs De Fruits Et Legumes” (which manages the 80% of exports) and the SEPAS - “Sénégalaise de Produits d’Exportation et de Services” (which holds the remaining 20%) [18].

This context reveals some criticism: the first concerns the fact of concentrating the management, dissemination and acceptance of such a data base, in the hands of the major professional organisations of the country. It is natural to wonder what happens to small producers not incorporated within a formal body or even more to women producers, largely excluded from these organisations, and therefore not calculated within the statistical estimates, as could be proven by the absence of specific indicators related to their particular status [19, 19 bis].

A second critical aspect, largely to a certain extent connected to the first, is referred to the solely focus of the management system and data collection on export crops, ignoring the crops for self-production [20], which play a key role in the food security of Senegal. This element would lead to think that where there are interests and economic resources, data can be formalised, computerised and well managed. It would imply that, to achieve similar results (in terms of availability and efficiency of statistics) but applied to other agricultural sub-sectors, more focused on the welfare of small farmers and their families, we must hope only in large international investment.

In relation with the more specific aspects of gender, the first element is that is not possible to identify, among all the available statistical sources, any document explicitly and exclusively dedicated to gender issues (except for the SNEEG 2015, but which does not constitute a statistical source in the strict sense). Therefore, we proceeded to analyse how the gender component (relating to the socio-demographic and more purely agricultural-economic variables) was present/available (and at what level of detail) within the supply of statistical information.

In synthesis, on the basis of the examination of the main Senegalese statistical sources and policies documents [21] as well as in according to the outcomes of the mission of March 2013, the statistics failures related to gender (in agriculture or not) in a country as Senegal, may be summarized in the following open questions:

- the weak mastery of the concept of gender as well as its utility, noted by the same human resources within the National Statistical System;
- the lack of coordination at the level of gender statistics production, as well as between producers and farmers, and producers and users; the insufficient consideration of gender in planning and implementation of the activities of data collecting, processing and analysing;
- the weak consideration of gender issues in sectoral programs (for instance in the new Agricultural Programme 2011-2012 [22] the word gender is never mentioned) and within the national budget; as well as the most frequently cited, limited application of the gender dimension to the field of socio-demographic statistics (population, education, health...);
- the difficulties of data centralisation due to the cross-cutting nature of gender, an issue involving in a different ways many sectors of the economy and society; the insufficient level of information and/or knowledge on gender issues registered at all levels (i.e. both in relation to the whole population, both to technicians and professionals, as well as to the political and managerial class);
- the absence of a clear methodology and tools designed to the integration of the gender dimension in the statistical production.

As occurred in the wider issues strictly related to gender, also with regards to the regional dimension of the Senegalese statistics, it is possible to identify different levels of complexity, such as:

- the multiplicity of actors involved (users/producers) without an unified framework of consultation/coordination;
- the absence of institutional framework and methodology to collect, archive, and spread harmonized data, aimed to manage and make as effective as possible the dissemination of the regional statistics information;
- the inadequacy of human and material resources available to the various regional services of the National Statistical Agency (“ANSD”);
- regarding the specific agricultural sector, the more often criticized, lack of opportunities for consultation with

- producers, which can help both the technicians to obtain more specific and complete investigations, both the producers themselves to be more involved and aware of the importance of the whole statistical process;
- the limited decentralisation of the regional statistics services (both in terms of decision-making power, as well as financial availability and independent resources management).

In brief it is possible to extrapolate a series of cross-cutting issues to the different above mentioned aspects (i.e. data supply on: gender, regional dimension and agricultural sector) such as the weakness of the institutional framework and the lack of coordination among the different statistical areas, combined with a multitude of sources and the absence of a permanent system of consultation and harmonisation of data.

In addition, the already cited problems related to the financing of the statistics field. In relation to this, we can note often, sample surveys conducted on the ground, but only thanks to the intervention of an international donor directly affected by that specific issue (a factor that limits the impact of these surveys, as well as a widespread sharing of its outputs among multiple actors, especially considering time and costs occurred for this type of activities).

At methodological level, there are other obstacles related to data processing, such the archive and dissemination of statistical information, the latter linked to the excessive length of processing data phase, which results in the fact that often the data processed are already old at the time of their publication.

### **Conclusions**

In conclusion, the integration of gender issues within the Senegalese statistics (especially at regional and local levels) should go hand in hand with public policies more attentive to gender and its concrete implementation, in the overall areas of Senegalese economy and society. The two sectors should proceed jointly, in particular by virtue of their close connection, which is necessary on the one hand, to gender policies to find more support and feedback in the reality (as facilitate awareness of multiple stakeholders on the importance of gender); and useful at the same time, to the statistics to achieve a greater recognition of its usefulness. A recognition that could help the sector to attract more (national and international) investments as well as an improvement of the management of the whole system.

This research was focused on the identification of gender indicators to use in the specific context of rural development projects. The case study was limited to Senegal, in the framework of an international development project. However, the authors purpose is extend the impact of these indicators in different geographic and cultural contexts, but even related to gender issues in rural environments. In particular, the nature and the incrementing complexity of these indicators could be suitable to evaluate the effective participation degree of women in development and rural projects, starting to evaluate their general level of empowerment and the main obstacles to access to the same rights, inputs, resources (as the property of land) and decision power than men. Furthermore, the elaboration of multiplex gender indicators could constitute an efficient tool for national and sub-regional gender policies as well as lobby activities

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### **LIST OF ACRONYMS**

aGII: adapted Gender Inequality Index

ANSD: Agence Nationale de la Statistique et de la Demographie

BMI: Body Mass Index

CISAO: Centro Interdipartimentale di Ricerca e di Cooperazione Scientifica con i Paesi del Sahel e dell’Africa Occidentale

DGCS: Direzione Generale della Cooperazione allo Sviluppo

GEM: Gender Empowerment Measure

GHI: Global Hunger Index

GII: Gender Inequality Index

IAO: Istituto Agronomico d'Oltremare

ONAPES: Organisation Nationale Des Producteurs Et Exportateurs De Fruits Et Legumes

SEPAS: Sénégalaise de Produits d’Exportation et de Services

SNEEG 2015: Strategie Nationale pour l'Egalité et l'Equité de Genre



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